Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Apparatus for imaging a pattern on a surface,~~use in synthesis of arrays of DNA probes, polypeptides, and the like,~~ comprising:

(a) a substrate with an active surface on which the arrays may be formed;

(b) an image former providing a high precision, two-dimensional light image projected onto the substrate active surface, comprising:

(1) a light source providing a light beam;

(2) a micromirror device receiving the light beam from the source and formed of an array of electronically addressable micromirrors, each of which can be selectively tilted between one of at least two separate positions, wherein in one of the positions of each micromirror the light from the source incident upon the micromirror is deflected away from an optical axis and in a second of the at least two positions of the micromirror the light is reflected along the optical axis; and

(3) projection optics receiving the light reflected from the micromirrors along the optical axis and imaging the pattern of the micromirrors onto the active surface of the substrate.

2. (Original) The apparatus of Claim 1 wherein the micromirror device is formed of a two dimensional array of micromirrors.

3. (Original) The apparatus of Claim 1 including a lens for collimating the beam from the light source to provide a collimated beam projected onto the micromirror array at an oblique angle to a main optical axis that extends from the micromirror array to the substrate, and wherein in one position of each micromirror the light is reflected along the optical axis through the projection optics to the substrate and in a second position of each micromirror the light from the source is reflected at an angle off the main axis of the projection system and away from the substrate.

4. (Original) The apparatus of Claim 1 wherein the light source provides an output beam to a lens which collimates the output beam, and including a beam splitter positioned between the micromirror array and the projection optics and receiving the collimated beam from the source, the beam splitter reflecting a portion of the beam to the micromirror array and receiving reflected light from the micromirror array along a main optical axis of the apparatus that extends from the micromirror array through the projection optics to the substrate, the beam splitter partially passing the light from the micromirror therethrough to the projection optics to be imaged on the active surface of the substrate.

5. (Original) The apparatus of Claim 1 further including a filter receiving the light from the source and which selectively passes only desired wavelengths through to the micromirror array.

6. (Original) The apparatus of Claim 1 wherein the substrate is transparent and light from the image former is passed through the transparent substrate to be imaged on the

active surface of the substrate which is opposite to the surface which initially receives the light from the image former.

7. (Original) The apparatus of Claim 6 further including a flow cell enclosing the active surface of the substrate and having ports for applying reagents into the flow cell which can be flowed over the active surface of the substrate.

8. (Original) The apparatus of Claim 1 further including a computer connected to the micromirror device to provide command signals to control the deflection of the mirrors in the micromirror array to provide a desired pattern for projection onto the substrate.

9. (Original) The apparatus of Claim 1 wherein the light provided by the light source is in the range of ultraviolet to near ultraviolet wavelengths.

10. (Original) The apparatus of Claim 9 including a filter receiving the light from the source which selectively passes wavelengths in the ultraviolet and near ultraviolet and blocks longer wavelengths including infrared.

11. (Original) The apparatus of Claim 10 wherein the filter includes a dichroic mirror that reflects the selected wavelengths and passes the wavelengths to be blocked.

12. (Original) The apparatus of Claim 1 wherein the projection optics include focussing lenses and an adjustable iris, one of the lenses passing light through the adjustable iris and the other lens receiving the light passed through the iris and focussing that light onto the active surface of the substrate.

13. (Original) The apparatus of Claim 1 wherein the pattern of the micromirrors that is imaged onto the active surface of the substrate is reduced in size with respect to the size of the array of micromirrors.

14. (Original) The apparatus of Claim 1 wherein the projection optics is comprised of telecentric refractive optical elements, and including refractive lenses between the light source and the micromirror device that form a Kohler illumination system.

15. (Currently Amended) The apparatus of Claim 1 wherein the projection optics ~~is~~ comprises telecentric ~~and is comprised of~~ reflective optical elements.

16. (Original) The apparatus of Claim 15 wherein the reflective optical elements include a concave mirror and a convex mirror, the concave mirror reflecting light from the micromirror device to the convex mirror which reflects it back to the concave mirror which reflects the light to the substrate where it is imaged.

17. (Original) The apparatus of Claim 16 including a planar mirror that reflects the light from the concave mirror to the substrate.

18. (Canceled)

19. (Original) The apparatus of Claim 1 including a flow cell having a housing composed of a lower base and upper cover section and a gasket mounted on the base, wherein the substrate is a transparent glass slide secured between the upper cover section and the base to define a sealed reaction chamber between the substrate and the base that is sealed by the gasket,

and channels extending through the housing from the input port to the reaction chamber and from the reaction chamber to the output port, the active surface of the substrate facing the sealed reaction chamber.

20. (Original) The apparatus of Claim 19 including means for detachably securing the substrate between the lower base and upper cover section to allow the substrate to be replaced.

21. (Currently Amended) Apparatus for imaging a pattern on a surface,~~use in synthesis of arrays of DNA probes, polypeptides, and the like,~~ comprising:

(a) a substrate with an active surface on which the arrays may be formed;

(b) a flow cell enclosing the active surface of the substrate and having ports for applying reagents into the flow cell which can be flowed over the active surface of the substrate;

(c) an image former providing a high precision, two-dimensional light image projected onto the substrate active surface, comprising:

(1) a light source providing a light beam;

(2) A micromirror device receiving the light beam from the source and formed of an array of electronically addressable micromirrors, each of which can be selectively tilted between one of at least two separate positions, wherein in one of the positions of each micromirror the light from the source incident upon the micromirror is deflected away from an

optical axis and in a second of the at least two positions of the micromirror the light is reflected along the optical axis; and

(3) projection optics receiving the light reflected from the micromirrors along the optical axis and imaging the pattern of the micromirrors onto the active surface of the substrate.

22. (Original) The apparatus of Claim 21 wherein the micromirror device is formed of a two dimensional array of micromirrors.

23. (Original) The apparatus of Claim 21 including a lens for collimating the beam from the light source to provide a collimated beam projected onto the micromirror array at an oblique angle to a main optical axis that extends from the micromirror array to the substrate, and wherein in one position of each micromirror the light is reflected along the optical axis through the projection optics to the substrate and in a second position of each micromirror the light from the source is reflected at an angle off the main axis of the projection system and away from the substrate.

24. (Original) The apparatus of Claim 21 wherein the light source provides an output beam to a lens which collimates the output beam, and including a beam splitter positioned between the micromirror array and the projection optics and receiving the collimated beam from the source, the beam splitter reflecting a portion of the beam to the micromirror array and receiving reflected light from the micromirror array along a main optical axis of the apparatus that extends from the micromirror array through the projection optics to the substrate, the beam

splitter partially passing the light from the micromirror therethrough to the projection optics to be imaged on the active surface of the substrate.

25. (Original) The apparatus of Claim 21 further including a filter receiving the light from the source and which selectively passes only desired wavelengths through to the micromirror array.

26. (Original) The apparatus of Claim 21 wherein the substrate is transparent and light from the image former is passed through the transparent substrate to be imaged on the active surface of the substrate which is opposite to the surface which initially receives the light from the image former.

27. (Original) The apparatus of Claim 21 further including a computer connected to the micromirror device to provide command signals to control the deflection of the mirrors in the micromirror array to provide a desired pattern for projection onto the substrate.

28. (Original) The apparatus of Claim 21 wherein the light provided by the light source is in the range of ultraviolet to near ultraviolet wavelengths.

29. (Original) The apparatus of Claim 28 including a filter receiving the light from the source which selectively passes wavelengths in the ultraviolet and near ultraviolet and blocks longer wavelengths including infrared.

30. (Original) The apparatus of Claim 29 wherein the filter includes a dichroic mirror that reflects the selected wavelengths and passes the wavelengths to be blocked.

31. (Original) The apparatus of Claim 21 wherein the projection optics include focussing lenses and an adjustable iris, one of the lenses passing light through the adjustable iris and the other lens receiving the light passed through the iris and focussing that light onto the active surface of the substrate.

32. (Original) The apparatus of Claim 21 wherein the pattern of the micromirrors that is imaged onto the active surface of the substrate is reduced in size with respect to the size of the array of micromirrors.

33. (Original) The apparatus of Claim 21 including refractive lenses between the light source and the micromirror device that form a Kohler illumination system.

34. (Currently Amended) The apparatus of Claim 21 wherein the projection optics is comprised of telecentric ~~and is comprised of~~ reflective optical elements.

35. (Original) The apparatus of Claim 34 wherein the reflective optical elements include a concave mirror and a convex mirror, the concave mirror reflecting light from the micromirror device to the convex mirror which reflects it back to the concave mirror which reflects the light to the substrate where it is imaged.

36. (Original) The apparatus of Claim 35 including a planar mirror that reflects the light from the concave mirror to the substrate.

37. (Canceled)

38. (Original) The apparatus of Claim 21 wherein the flow cell has a housing composed of a lower base and upper cover section is a gasket mounted on the base, wherein the substrate is a transparent glass slide secured between the upper cover section and the base to define a sealed reaction chamber between the substrate and the base that is sealed by the gasket, and channels extending through the housing from the input port to the reaction chamber and from the reaction chamber to the output port, the active surface of the substrate facing the sealed reaction chamber.

39. (Original) The apparatus of Claim 38 including means for detachably securing the substrate between the lower base and upper cover section to allow the substrate to be replaced.

40-42. (Canceled)